

Preface

This issue of *Environmental Health Perspectives* is the second of two volumes comprising papers presented at the Conference on "Biomonitoring and Susceptibility Markers in Human Cancer: Applications in Molecular Epidemiology and Risk Assessment," which was held October 26 through November 1, 1991, in Kailua-Kona, Hawaii. This conference was organized by the International Agency for Research on Cancer (IARC, Lyon, France) and by the National Center for Toxicological Research/FDA (NCTR, Jefferson, Arkansas, USA), and was additionally sponsored by the U.S. Environmental Protection Agency, the Commission of the European Communities, the Health Effects Institute, and the U.S. National Cancer Institute.

The first volume focuses on biomarkers of susceptibility and includes papers on *a*) the relationship of molecular, chromosomal, and cellular susceptibility markers and the multistage carcinogenesis process in humans; and *b*) the role of genetic polymorphism of xenobiotic-metabolizing enzymes in cancer susceptibility. The second volume describes *a*) recent progress in biomonitoring techniques and molecular dosimetry approaches and their application to various populations exposed to carcinogens; and *b*) issues and implications for using biomarkers in cancer epidemiology and risk assessment.

Interest is increasing in organizing multidisciplinary meetings that bring together experimental oncologists, cancer epidemiologists, geneticists, and clinicians to explore the potential of integrated laboratory and field studies. Although one of the first meetings of this kind was in 1972,¹ progress was slow in the following decade, as available knowledge was too limited to allow any recommendations useful for cancer control and prevention. However, the concept of combined laboratory and epidemiological studies of human cancer was then recognized and gained support, as evidenced in subsequent²⁻⁵ conferences. This new

approach has since been named metabolic, biochemical, or molecular epidemiology.

This latest meeting discussed recently developed markers for use in molecular epidemiological studies for identifying subpopulations and (hopefully) individuals at higher risk for cancer, either because they are more highly exposed to carcinogens or because inherited or acquired host factors render them more susceptible. For these individuals, once identified, steps can be taken to minimize exposure. A note of caution, however, is needed when discussing genetic variations and susceptibility to environmental agents. It is essential that any scientific results that show an elevated, relative, or attributable risk associated with any specific genetic trait in relation to specific exposure and to disease outcome should have the most rigorous possible methodological and theoretical basis. Otherwise, unethical or undesirable use of such information will preclude any beneficial impact.

We are pleased that a number of epidemiologists attended this meeting in contrast to similar conferences where this discipline was frequently underrepresented. In view of *a*) the pace of development of tools from molecular dosimetry, molecular biology, and genetics, as described at this meeting, and *b*) the fact that many studies published under the label of molecular epidemiology have serious limitations of epidemiological/statistical design (and should at best be called laboratory investigations on human subjects), the field needs epidemiologists interested in developing new strategies for the efficient deployment of these biomarkers.

We hope that the major advances presented at this meeting, along with the excellent presentations and enthusiasm of the participants, will accelerate ongoing research in molecular and biochemical epidemiology. In turn, this should significantly improve the process of cancer risk assessment and prevention and protect the public health.

Finally, we are grateful to M. Anderson, X. Bosch, C.C. Harris, R. Hayes, S.S. Hecht, P. Kleihues, J. Lewtas, A. Likhachev, G. Lucier, F.P. Perera, R.J. Scheuplein, D. Shuker, A. Sivak, S.R. Tannenbaum, P. Vineis, C.P. Wild, and H. Yamasaki, who spent considerable time in helping to establish the objectives of this symposium and assembling the program.

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¹Host-Environment Interactions in the Etiology of Cancer in Man. IARC Scientific Publications No. 7 (R. Doll and E. Vodopija, Eds.), IARC, Lyon, 1973.

²Host Factors in Human Carcinogenesis. IARC Scientific Publications No. 39 (H. Bartsch and B. Armstrong, Eds.), IARC, Lyon, 1982.

³Monitoring Human Exposure to Carcinogenic and Mutagenic Agents, IARC Scientific Publications No. 59 (A. Berlin, M. Draper, K. Hemminki, and H. Vainio, Eds.), IARC, Lyon, 1984.

⁴DNA Adducts: Dosimeters to Monitor Human Exposure to Environmental Mutagens and Carcinogens (F.J. de Serres, B.L. Gledhill, and W. Sheridan, Eds.) Environ. Health Perspect. Vol. 62.

⁵Methods for Detecting DNA Damaging Agents in Humans: Applications in Cancer Epidemiology and Prevention. IARC Scientific Publications No. 89 (H. Bartsch, K. Hemminki and T. K. O'Neill, Eds.), IARC, Lyon, 1988.